

CONSERVATION TILLAGE

WHAT is conservation tillage?

Tillage refers to turning over the soil to prepare it for planting crops or to control weeds.

Conservation tillage is a seed planting technique that minimizes the disruption of soil.

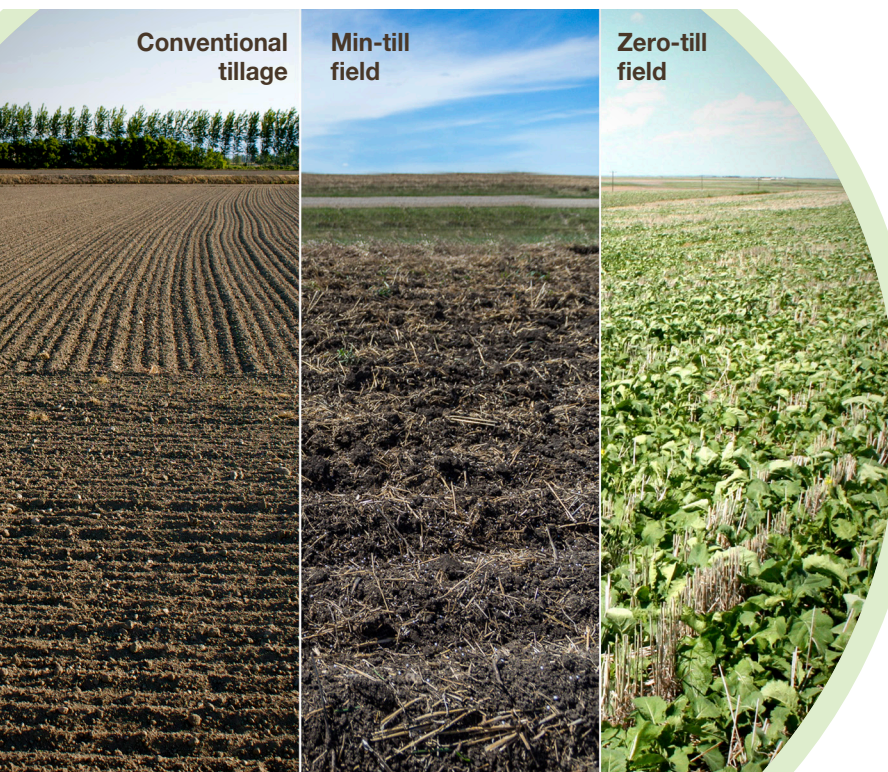
Farmers use special equipment to plant seeds, leaving most of the **residues** (stalks or **stubble**, stems, leaves and seed pods) of the previous crop intact to hold soil in place and add organic matter and nutrients to the soil. This method helps prevent soil erosion and conserves moisture because the soil is covered with plant material.

Minimum-till (min-till) and **zero-till** (also called **no-till**) are forms of conservation tillage.

Min-till uses some tillage but uses stubble to anchor the soil and the plant residue on the soil surface. Zero-till works in the same way, but there is less disruption of soil and crop residues (i.e., the planter does not go as deep into the soil to plant seeds, and no crop residues are turned over).

Min-till = 30%
of previous year's crop stalks remain visible on the field surface¹

Zero-till = 70-75%
of previous year's crop on the surface²



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BEFORE CONSERVATION TILLAGE

Prior to the 1980s, growing crops involved tilling the soil multiple times with different types of equipment. This practice was called **conventional tillage**. This type of tillage was used to control weeds and prepare the soil for seeding crops.

The problem: The soil surface was left bare, which resulted in soil erosion and loss of moisture.

Topsoil, which is about 10-25 cm deep, contains nutrients and organic matter that are necessary for growing plants. Without topsoil, crop yields (amounts produced) are very low.



Soil blown from fields into ditches as a result of soil erosion

Globally, up to **50,000 square kilometers** of land (an area equivalent to the size of Costa Rica) suffers from soil erosion caused by wind and water.³

In the 1930s, a combination of drought and frequent tillage caused a major farming crisis on the Canadian Prairies. High winds and lack of rain caused the topsoil to blow away, turning the sky dark with dust while devastating farmers' crops. Today, improved farming practices, including min-till and zero-till, help guard against topsoil loss and keep our air cleaner.

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BENEFITS OF CONSERVATION TILLAGE

- Minimal soil erosion caused by wind and water occurs because crop stubble is left in place.
- Soil quality is enhanced by the presence of organic matter and nutrients, resulting in healthier, more productive crops.
- Crops are less affected by drought and dry conditions because of soil organic matter's ability to retain moisture, and take up water and move it throughout the soil.
- Farmers spend less money on labour and fuel because machinery passes over fields fewer times.

GOOD FOR THE ENVIRONMENT!

- Less soil erosion occurs.
- Undisturbed soil holds soil nutrients and prevents them from disappearing into ground water.
- Fewer greenhouse gases are emitted from farm equipment because farmers don't need to till the soil multiple times in order to control weeds.
- Previous year's crop left on the soil surface provides a habitat for insects, nesting birds and small mammals.

How do farmers control weeds without tilling the soil?

Farmers use **herbicides** to control weeds. Herbicides are substances that eliminate unwanted plants that compete with crops for nutrients, space, water and sunlight.



Dandelion

In Canada, zero-till practices are used to prepare 59% of land area for seeding.⁵ Saskatchewan leads Canada and the world in the adoption of reduced tillage practices. In 2016, 74% of the province's cropland was prepared using zero-till, and 19% was prepared using minimum tillage.⁶

It can take **100 to more than 500 years** to form **2 cm** of topsoil!⁴ Conservation tillage helps rebuild topsoil by slowly adding the organic matter from the previous year's crop.



Farm equipment at work on zero-till field

